



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/670,436

09/25/2003

Bernd Hofflinger

03481-P0007A

5537

24126

7590

10/18/2007

ST. ONGE STEWARD JOHNSTON & REENS, LLC

986 BEDFORD STREET

STAMFORD, CT 06905-5619

EXAMINER

NEGRON, WANDA M

ART UNIT

PAPER NUMBER

2622

MAIL DATE

DELIVERY MODE

10/18/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/670,436

Applicant(s)

HOFFLINGER ET AL.

Examiner

Wanda M. Negrón

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 14-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claim 14** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Lines 14-16 of claim 14 recite, "wherein the light-sensitive elements are illuminated only when image signals read-out during consecutive third time intervals differ by more than a second threshold value". The feature of the image signals that is being compared to a "threshold value" is unclear. In addition, the first value alluded to by the phrase "second threshold value" is unclear. Also, the meaning of the phrase "consecutive third time intervals" is unclear. For examining purposes, for the remainder of this Office action lines 14-16 of claim 14 have been interpreted as reciting -- wherein the light-sensitive elements are illuminated only when the brightness of image signals read out during three consecutive time intervals differ by more than a first threshold value --.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

Art Unit: 2622

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-5, 7-12, and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over He et al. (US 6,355,965 B1) in view of Yamaguchi et al. (US 6,240,252 B1).**

Regarding **claims 1 and 15**, He et al. teach a camera module for electronically recording images, i.e. an image device using solid-state MOS integrated circuits (see col. 1, lines 17-23), the module comprising an image sensor (see figure 1) having a plurality of image cells (see col. 1, lines 29-35), wherein each image cell is adapted to provide an electric image signal as a function of incident light, i.e. converting the current produced by incident light to a voltage (see col. 1, lines 39-40), and each image cell having a light-sensitive element, e.g. a photodiode ( $D_A$ ), for generating a light-dependent current (see col. 1, lines 50-53), and at least one MOS transistor ( $M1_A$ ) having a gate terminal and a source-drain path, said MOS transistor being arranged in series with the light-sensitive element (see figure 1, elements  $D_A$  and  $M1_A$ ), the gate of the transistor being at a fixed potential, e.g.  $V_{DD}$ , and the source-drain path being flowed through by the light-dependent current (see col. 1, lines 50-51). However, He et al. do not disclose that said module also comprises at least one light source arranged in a vicinity of the image sensor, said light source being adapted to illuminate the image cells, wherein the at least one light source is configured to illuminate the light-sensitive elements whenever a predefined basic brightness exceeds a first threshold value.

Yamaguchi et al., on the other hand, discloses a camera with a lighting system wherein a light source, i.e. auxiliary light module 24, is arranged in the vicinity of the image sensor, i.e. light-sensitive surface F (see figure 1), said light source being adapted to illuminate the image sensor (see figure 1), i.e. adapted to directly illuminate the scene to be photographed, the image sensor receiving the light reflected from the scene. Yamaguchi et al. also discloses that the at least one light source is configured to illuminate the image sensor whenever a predefined basic brightness exceeds a first threshold value, i.e. the auxiliary light module 24 is activated in a backlight flash mode when a background brightness exceeds a subject brightness in the same scene (see col. 16, lines 4-6 and col. 18, lines 52-56).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the light source disclosed by Yamaguchi et al. in the electronic camera module taught by He et al. because a proper exposure could be obtained even if the main subject to be photographed is dark and the backlight is bright.

Regarding **claims 2-4 and 16**, Official Notice is taken that the use of camera modules in an invisible spectral region, an infrared spectral region, and in a region of about 880 nm is well known in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a light source that illuminates within any of said spectral regions because it would increase the spectral operating range of the camera module, and it would allow imaging in low light environments.

Regarding **claims 5 and 17**, Official notice is taken that the concept and the advantage of having a flash unit integrated into the camera module in a stationary fashion is old and well known in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the flash unit integrated into the camera module in a stationary fashion in order to prevent losing a separable flash unit.

Regarding **claim 7**, Official Notice is taken that the concept and the advantage of arranging an image sensor circuit in the same printed circuit board as other camera elements is well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art to arrange the light source in the same circuit board as the image sensor, i.e. to connect the light source circuit board to the image sensor circuit board for power consumption or communication purposes, because this reduces the size of the camera module making it more compact.

Regarding **claims 8 and 18**, Official Notice is taken that a timing element is conventionally used to accurately perform the integration and read-out processes in an imaging device. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a timing element to activate the light source for a predefined period of time as a function of the image signals because doing

so would decrease the power required to operate the camera since the light source would only be used when necessary.

Regarding **claims 9, 10 and 19**, Official Notice is taken that a control element such as a CPU is conventionally used to control the operation of the elements in a camera. In addition, it would be inherent to obtain an image signal representing a mean light intensity that is higher when using a light source than an image signal representing a mean light intensity without the light source because, when the light source is turned on, more photons impinge on the sensor than without it. The factor by which the mean light intensity would be higher depends on the output of the light source and the period of time it is turned on for illumination of the pixels by a controlling element. A factor range of 5-200 or 10-100 would be obtained by controlling the light source to turn on for the required amount of time.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a CPU to control the operation of the light source such that the image signals representing a mean light intensity using a light source is higher than compared without the light source by a factor of approximately 5-200, and 10-100 because this would increase the dynamic range of the camera module.

Regarding method **claim 11**, it is drawn to the method of using the corresponding apparatus claimed in claim 1. Therefore method claim 11 corresponds to apparatus claim 1, and is rejected for the same reasons of obviousness as used above.

Regarding **claim 12**, Official Notice is taken that, conventionally, in an image sensor the electric image signals are read out during first time intervals which are separated from one another, and wherein the light-sensitive elements are illuminated during second time intervals separated from one another, the first and second time intervals being different from one another. In other words, conventionally, the sensing cells are not illuminated during the read-out process. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to read out the electric image signals during first time intervals which are separated from one another, and wherein the light-sensitive elements are illuminated during second time intervals separated from one another, the first and second time intervals being different from one another because this would prevent unintended image signals to be added to the image signals being read out.

**Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over He et al. (US 6,355,965 B1) in view of Meek et al. (US Patent No. 6,741,286 B2).**

Regarding **claim 6**, He et al. teach a camera module for electronically recording images, i.e. an image device using solid-state MOS integrated circuits (see col. 1, lines 17-23), the module comprising an image sensor (see figure 1) having a plurality of image cells (see col. 1, lines 29-35), wherein each image cell is adapted to provide an electric image signal as a function of incident light, i.e. converting the current produced



Art Unit: 2622

by incident light to a voltage (see col. 1, lines 39-40), and each image cell having a light-sensitive element, e.g. a photodiode ( $D_A$ ), for generating a light-dependent current (see col. 1, lines 50-53), and at least one MOS transistor ( $M1_A$ ) having a gate terminal and a source-drain path, said MOS transistor being arranged in series with the light-sensitive element (see figure 1, elements  $D_A$  and  $M1_A$ ), the gate of the transistor being at a fixed potential, e.g.  $V_{DD}$ , and the source-drain path being flowed through by the light-dependent current (see col. 1, lines 50-51). However, He et al. do not disclose that said module also comprises at least one light source arranged in a vicinity of the image sensor, said light source being adapted to illuminate the image cells, wherein the light source is designed in the shape of a ring surrounding the image sensor.

Meek et al., on the other hand, discloses a camera with a lighting system wherein a light source, i.e. an LEDs assembly (17), is arranged in the vicinity of the image sensor 12 (see figure 1), said light source being adapted to illuminate the image sensor (see figure 1), i.e. adapted to directly illuminate the scene to be photographed, the image sensor receiving the light reflected from the scene, wherein the light source is designed in the shape of a ring surrounding the image sensor (see figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the light source disclosed by Meek et al. in the electronic camera module taught by He et al. because a very compact camera device (see Meek et al., col. 3, lines 31-32) would be obtained by encapsulating the camera and the light source in an integral unit (see Meek et al., col. 3, line 20-22), wherein the light source provides the required light for proper exposure of dark scenes.

***Allowable Subject Matter***

**Claim 14** would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding **claim 14**, the relevant prior art does not anticipate or render obvious that the light-sensitive elements are illuminated **only when the brightness of image signals read out during three consecutive time intervals differ by more than a first threshold value.**

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Lungershausen et al. (US Patent No. 5,701,015) disclose an infrared illumination device using a plurality of LEDs such as Hitachi's HE 8812 (datasheet is provided).
- Clarke et al. (US Patent No. 5,956,163) disclose an image sensor, wherein a light emitting apparatus is disposed in or over a spacing between lenses in a lens arrangement.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wanda M. Negrón whose telephone number is (571) 270-1129. The examiner can normally be reached on Mon-Fri 6:30 am - 4:00 pm alternate Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wanda M. Negrón/

Examiner, Art Unit 2622  
October 10, 2007



DAVID OMETZ  
SUPERVISORY PATENT EXAMINER